CLAIMS:

1. A perfusion monitor for monitoring tissue perfusion in a body including:-

a probe, arranged to generate a pulsed source of light for irradiation onto a part of a body and a matched sensor, which transduces variations in the reflected light to an electric signal; and.

a signal processor, which receives the electric signal and compares the signal at a first time when the pulsed light source is on with a second time when the pulsed light is off, the first and second times being almost concurrent, and processes the signal to reduce or ameliorate the effect of ambient light in the signal.

2. A perfusion monitor for monitoring tissue perfusion in a body as claimed in claim 1 wherein the probe is arranged to generate a pulsed source of infrared light.

3. A perfusion monitor for monitoring tissue perfusion in a body as claimed in claim 1 or claim 2 further including:

means for digitally sampling the signal;

means for generating a pulse curve from the signal

means for calculating a heart rate (HR) from the pulse curve;

means for determining a running value A for the area under the pulse curve: and means for calculating a Tissue Perfusion Index (TPI) defined by:

$TPI = A \times HR \times k$ where:

A = running value for area under signal curve

HR = value for Heart Rate

k = physiological constant for specific tissue.

4. A perfusion monitor for monitoring tissue perfusion in a body as claimed in claim 3 further including a display and/or warning system which at the user's discretion, displays either individual waveforms or selected combinations of waveforms, or a continuous single waveform with a running trace of the TPI trend.

5. A perfusion monitor for monitoring tissue perfusion in a body as claimed in claim 4 wherein the warning system is arranged so that selected characteristics of the waveform shape and/or changes in the TPI activate an audible alarm when the measurement moves above or below pre-defined limits.

6. A perfusion monitor for monitoring tissue perfusion in a body as claimed in any preceding claim wherein the light generated by the pulsed source is monochromatic.

7. A perfusion monitor for monitoring tissue perfusion in a body including:-

a probe, arranged to generate a pulsed source of light for irradiation onto a part of a body and a matched sensor, which transduces variations in the reflected light to an electric signal; and.

a signal processor, which receives the electric signal and compares the electrical signal at a first time when the pulsed light source is on with a second time when the pulsed light is off, the first and second times being almost concurrent, the signal processor including

means for processing the electrical signal to reduce or ameliorate the effect of ambient light in the signal;

means for generating a pulse curve from the signal.

means for calculating a heart rate (HR) from the pulse curve;

means for determining a running value A for the area under the pulse curve:

means for calculating a tissue perfusion index (TPI) from HR x pulse curve area, where

$$TPI = A \times HR \times k$$ where:

A = running value for area under signal curve

HR = value for Heart Rate

k = physiological constant for specific tissue.

8. A perfusion monitor for monitoring tissue perfusion in a body as claimed in any preceding claim wherein the probe includes two fibre optic cable tubes disposed side by side through one of which the pulsed light source is transmitted and through the other of which the reflected light is received.

9. A method of measuring microcirculatory blood flow in a body comprising the steps of:

using an emitter of pulsed light to irradiate an area of the body for measurement of microcirculatory changes;

receiving light reflected from the area at a distance from the area being irradiated by the incident light; and

determining from the reflected light a measure of the changes that correspond with the pulsatile filling and partial emptying of the microcirculation.

10. A method of measuring microcirculatory blood flow in a body as claimed in claim 9 wherein the step of determining from the reflected light a measure of the changes that correspond with the pulsatile filling and partial emptying of the microcirculation includes the steps of

digitally sampling the signal;

generating a pulse curve from the signal

calculating a heart rate (HR) from the pulse curve;

determining a running value A for the area under the pulse curve: and

calculating a Tissue Perfusion Index (TPI) defined by:

TPI = A x HR x k where:

A = running value for area under signal curve

HR = value for Heart Rate

k = physiological constant for specific tissue and

displaying key signal characteristics of the calculated TPI index.

11. A method of calculating the tissue perfusion index for an area or part of a body comprising the steps of:

using an emitter of pulsed light to irradiate an area of the body part for measurement of microcirculatory changes;

receiving light reflected from the area at a distance from the area being irradiated by the incident light;

digitally sampling the signal;

generating a pulse curve from the signal

calculating a heart rate (HR) from the pulse curve;

determining a running value A for the area under the pulse curve: and

calculating the Tissue Perfusion Index (TPI) defined by:

TPI = A x HR x k where:

A = running value for area under signal curve

HR = value for Heart Rate

k = physiological constant for specific tissue.

12. The use of the perfusion monitor of any one of claims 1 to 8 to monitor perfusion in chronic ulcers on the extremities, the surface of the retina, the vascular pulp within a tooth or the surface of internal organs.

13 The use of the method of any one of claims 9 to 11 to monitor perfusion in chronic ulcers on the extremities, the surface of the retina, the vascular pulp within a tooth or the surface of internal organs.

5